"The learning curve was steep," said 1Lt Bryan Cooper, "but the team was quickly working in concert with the other career fields, and we were able to install 260 lights in just one month!"

The placement of each light required meticulous detail. Each runway light is set directly across from its counterpart, and all lights are positioned at the correct elevation and alignment. To quickly and accurately set the lights in concrete, top wind trailer jacks and angle iron were used to develop a lighting can jig. More than 150,000 feet of trenches, conduit, counter poise for lightning protection, and wire were dug, placed and pulled.

The lighting design required airfield utility cuts that are costly in time and materials. We purchased a directional drill to cut costs and sent a team to attend school to learn the process. The machine has a rotating cutter head that spins, and the cuttings flow back to the beginning of the drill in a drilling mud. The directional drill cuts an opening wide enough to fit the required number of conduits, and they are pulled through to manholes that are set on either end.

"Some drills you could do in a heartbeat, but others were a real challenge," said SSgt Casey Kuhn, lead directional driller. "Overall, drilling saved us lots of time." The team perfected the process and saved 4,000 man-hours during the project in airfield trenching and repairs.

CAN DO, WILL DO, HAVE DONE

No matter how much technology was incorporated into the project, people are what made the job happen. Without the support of vehicle maintainers, Supply and Services, the crews on the airfield would not have been able to accomplish the project four weeks early and $500,000 under budget.

"Our young craftsmen were challenged with the impossible," said CMSgt Steven Kembel, project NCOIC, "and they overcame with outstanding results!"

All said and done, the team pumped enough water to fill eight Olympic-sized swimming pools, hauled the equivalent weight of 1,665 fully loaded C–17s, paved an area the size of 60 football fields, and placed enough electrical cable, counter poise and conduit to stretch up and down Mount Everest six times. In 170 days, the 819th/219th ERHS made its mark at this forward location and contributed to the capability of the United States Air Force. To the HORSE!

Capt Ryan Novotny is a project engineer with the 819th RHS, Malmstrom AFB, MT.

A1C Nathan Laidlaw operates a horizontal boring machine. The machine bores large holes for utility crossings under the airfield surface, eliminating trenching. *(Photo by SSgt Tony R. Tolley)*

One priority was to start procurement of a concrete batch plant, given that we would be placing over 2,500 cubic yards of concrete. We started procurement in June, but the batch plant didn't arrive until Sept 7. Time constraints necessitated use of the DPRS until the batch plant was operational.

During the first three months of the project, more than 1,800 cubic yards of concrete were produced using the DPRS, with more than 1,000 cubic yards produced in one month. Those who have used a DPRS will understand what a major undertaking that was.

The DPRS is a mobile concrete machine designed for airfield damage repair. It is designed to produce limited quantities of concrete quickly. However, on this project we used it continuously for the first three months, doing almost half of all the repairs with it.

The DPRS is sensitive to many variables, such as the size of stone or quality of sand. The vehicle mechanics did an incredible job of keeping it running, and the operators are to be commended for producing more in one month than, to my knowledge, anyone else ever has with a DPRS. Stone quality was very poor, and repairs made necessary by the use of large-size stone were continuous. The team was performing 60-70 repairs per week by the time the batch plant became operational.

Using the batch plant, we were able to place as many as 38 slabs in a single day. But we held out the last slab repair for the DPRS. Since the last slab was on a taxiway, and the base was in blackout conditions, we saw an opportunity for training and decided to do the repair at night using night vision goggles, or NVG. It was a real experience, and we learned a number of lessons that may prove useful for future use of NVG in performing airfield damage repair.

Lessons Learned

Lesson one is to spend a lot of time using the NVGs prior to doing a full repair. After first putting them on, it seems as if you can see everything and there will be no problem. It's only after you start working in them that you realize how severe the loss of depth perception is. Also, with no color vision the runway looks a lot like the edges. That may not be a big problem on a normal runway, but on a runway surrounded by landmines like Bagram, it could become a big problem quickly.

The viewpoint through NVGs is very different. I personally learned that the hard way when I managed to find the only 15-foot section, out of more than 20,000 feet of runway and taxiway edge, that had a 12-inch drop in a spot where we had removed the forms from a previous pour. Not that I heard anything from the troops about getting my SUV stuck on the side of an active taxiway — right.

Did we cheat some? Yes. We pulled out flashlights on occasion to check some things. Do I think that it could be done without cheating? Yes, but only with a lot more experience with the NVGs. We had done quite a bit of preparation prior to the pour and placed